the heat carrier medium are fed to a firing in which the residual containing carbon is burnt and the heat carrier medium is heated and fed to the pyrolysis reactor again. The pyrolysis gases containing tar are reheated in a second reaction zone such that a product gas having a high caloric value is obtained.--

A1

IN THE SPECIFICATION:

Page 1, line 1, after "method" insert --and apparatus--;

line 2, delete "according to the generic terms of Claim 1" and substitute therefor the following:

A2

--Specifically, the invention relates to a method and apparatus of gasifying organic substances and/or substance mixtures in which the organic substances are fed into a pyrolysis reactor and are kept in contact with a heat carrier medium so that rapid pyrolysis takes place in which the organic substances are reacted into pyrolysis products to form pyrolysis products including pyrolysis gases with condensable substances and a solid residue containing carbon. The solid residue containing carbon and the heated carrier medium are fed to a firing in which the residue containing carbon is fired and the heated carrier medium is heated and fed again to the pyrolysis reaction. The pyrolysis gases that contain tar are reheated in a second reaction zone so that a gas product is obtained which has a high caloric value. The pyrolysis is carried out in a moving bed reactor or a rotary drum. A reactant such as steam can be mixed in with the pyrolysis gases and fed into an indirect heat exchanger in which the pyrolysis gases react with the reactant. The waste gases produced from the firing are fed through the indirect heat exchanger such that their heat content is utilized for the reaction of the pyrolysis gases with the reactant. The ash of the solid residue

containing carbon and the heat carrier medium is removed from the firing and recycled into the pyrolysis reactor at the input end for the organic material.--;

before line 3, insert the following heading, centered on the page --**BACKGROUND OF THE INVENTION**--;

Page 2, line 11, delete "The object of the invention is to make available" and substitute therefor --In view of the deficiencies of the prior pyrolysis methods and apparatus, there is a need for--;

line 11, after "method" insert --and an apparatus--;

line 12, delete ". In this process," and insert therefor --and results in--;

lines 13 and 14, delete "is preferred. A further object of the invention is to make available a simply apparatus for carrying out the method";

before line 15, insert the following heading, centered on the page --**SUMMARY OF THE INVENTION**--;

lines 15 and 16, delete "With respect to the method, this object is resolved by the combination of features in Claim 1." and substitute therefor the following:

--The present invention pertains to an improved method and apparatus for gasifying organic containing substances which overcome the deficiencies of prior gasification methods and apparatuses. In particular, the invention pertains to a method and apparatus of gasifying organic substances and/or substance mixtures in which the organic substances are fed into a pyrolysis reactor and are kept in contact with a heat carrier medium so that rapid pyrolysis takes place in which the organic substances are reacted into pyrolysis products to form pyrolysis products including pyrolysis gases with condensable substances and a solid residue containing carbon. The solid residue

containing carbon and the heated carrier medium are fed to a firing in which the residue containing carbon is fired and the heated carrier medium is heated and fed again to the pyrolysis reaction. The pyrolysis gases that contain tar are reheated in a second reaction zone so that a gas product is obtained which has a high caloric value. The pyrolysis is carried out in a moving bed reactor or a rotary drum. A reactant such as steam can be mixed in with the pyrolysis gases and fed into an indirect heat exchanger in which the pyrolysis gases react with the reactant. The waste gases produced from the firing are fed through the indirect heat exchanger such that their heat content is utilized for the reaction of the pyrolysis gases with the reactant. The ash of the solid residue containing carbon and the heat carrier medium is removed from the firing and recycled into the pyrolysis reactor at the input end for the organic material.

Page 6, before line 30, insert the following:

--In summary, there is provided a method for the gasifying of organic containing substances and/or substance mixtures. The organic substances are fed into a pyrolysis reactor in which the organic substances are kept in contact with a heat carrier medium such that a rapid pyrolysis takes place in which the organic substances are reacted into pyrolysis products. The pyrolysis products include pyrolysis gases with condensable substances and a solid residue containing carbon. The solid residue containing carbon and the heat carrier medium are fed to a firing in which the residue containing carbon is fired and the heat carrier medium is heated and fed again to the pyrolysis reaction. The reuse of the heat carrier medium is referred to as the heat carrier medium cycle. Pyrolysis gases which include tar are reheated in a second reaction zone so that a gas product is obtained which has a high caloric value. The pyrolysis of the organic containing substances and/or substance mixtures is carried out in a moving bed reactor or a rotary drum.

In one preferable modification of the invention, a reactant, such as steam, is mixed in with the pyrolysis gases and then the reactant and pyrolysis gases are fed into an indirect heat exchanger in which the pyrolysis gases react with the reactant.

In another preferable modification, the waste gases produced from the firing are fed through the indirect heat exchanger such that their heat content is utilized for the reaction of the pyrolysis gases with the reactant.

In still another preferable modification, the ash of the solid residue which contains carbon and the heat carrier medium is removed from the firing and recycled into the pyrolysis reactor at the input end for the organic material.

In yet another preferable modification, the pyrolysis is carried out at a temperature of about 550-650°C. In still yet another preferable modification, the reaction of the pyrolysis gases with steam is carried out at a temperature of about 900-1000°C.

In a further preferable modification, the reaction of the pyrolysis gases with a reactant, such as steam, is carried out in the presence of a catalyst.

In still a further preferable modification, dolomite, calcite, nickel, nickel oxide, nickel aluminate, and/or nickel spinel are used as a catalyst.

In yet a further preferable modification, one or more catalysts are used simultaneously as the heat carrier medium for the heat carrier medium cycle.

In still yet a further preferable modification, the hot pyrolysis gases are dedusted before the addition of the reactant, such as steam.

In another preferable modification, the catalyst is fed to the hot pyrolysis gases in an entrained flow mode and is separated out after the reaction with steam, and returned to the hot pyrolysis gases in the heat carrier medium cycle.

A5

In still another preferable modification, the pyrolysis gases are dedusted and quenched after the reaction with the reactant.

In yet another preferable modification, a portion of the pyrolysis gas is fired and the resulting heat is utilized for the pyrolysis and/or the reaction with the reactant.

In still yet another preferable modification, the solid residue containing carbon and the heat carrier medium are fed to a grate firing.

In a further preferable modification, the gasification of the organic containing substances and/or substance mixtures is carried out with use of a pyrolysis reactor, a firing for the pyrolysis residue, a reaction zone for the pyrolysis gases, and a heat carrier cycle between the pyrolysis reaction and the firing.

In still a further preferable modification, the pyrolysis reactor includes a shaft kiln or a rotary drum that is equipped with a sluice for the organic containing substances and/or substance mixtures and a sluice for the heat carrier medium.

In yet a further preferable modification, the pyrolysis reactor includes a firing with a grate and the shaft kiln or rotary drum has a feed for the firing.

In still yet a further preferable modification, the waste gases produced from the firing can be fed to a heat exchanger that is connected with the shaft kiln or rotary drum via a line for the pyrolysis gases.

In another preferable modification, the firing is connected via a discharge apparatus, such as a worm, to a conveyor for the heat carrier medium.

In yet another preferable modification, the heat carrier medium includes fire-resistant materials such as sand, gravel, split, aluminum silicate, corundum, graywacke, quartzite, and/or cordierite.

A5

In still another preferable modification, the heat carrier medium includes molded bodies composed of metallic and/or non-metallic substances such as steel and/or ceramic balls.

In still yet another preferable modification, the heat carrier medium has a grain size of about 1-40mm.

In a further preferable modification, the firing is performed as a grate firing.

In yet a further preferable modification, the heat exchanger includes a catalyst filling.

In still a further preferable modification, the pipes of the heat exchanger include catalytically active material.

In still yet a further preferable modification, the heat exchanger is assigned to a solid bed reactor with catalyst feed.

In another preferable modification, the heat exchanger is first connected to a filter for dedusting.--;

END

✓ lines 30 and 31, delete all text;

✓ Page 7, lines 1 and 2, delete all text and substitute therefor the following:

A6

--The principal object of the invention is to make available a method and apparatus for generating a gas with a high caloric value that is easy to perform.

Another object of the present invention is the provision of a pyrolysis process that produces a small condensation portion.

A6

Further objects and advantages of the invention will become apparent to those skilled in the art from reading and understanding the following detailed description of various embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Reference may now be had to the drawings, which illustrate various embodiments that the invention may take in physical form and in certain parts and arrangement of parts wherein;~~:~~;

before line 9, insert the following heading, centered on the page --**DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS**--;

line 9, delete "It is evident from Figure 1" and substitute therefor the following:

A7

--Referring now to the drawings wherein the showings are for the purpose of illustrating preferred embodiments of the invention only, and not for the purpose of limiting the same, reference is made to FIGURE 1 which illustrates~~:~~;

Page 8, line 3, delete "Figure" and substitute therefor --FIGURE--;

line 15, delete "Figure" and substitute therefor --FIGURE--;

line 22, delete "Figure" and substitute therefor --FIGURE--;

Page 10, delete the entirety of 17 and substitute therefor, centered on the page --**EXAMPLE 1**--;

Page 12, after line 3, insert the following paragraph:

A8

--The invention has been described with reference to a preferred embodiment and alternatives thereof. It is believed that many modifications and alterations to the embodiments discussed herein